UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,551	03/29/2004	Edward Andrew Fleming	4383 0002	8286

27886 7590 09/11/2006

DEETH WILLIAMS WALL LLP
150 YORK STREET
SUITE 400
TORONTO, M5H 3S5
CANADA

EXAMINER	
BELL, BRUCE F	

ART UNIT	PAPER NUMBER
1746	

DATE MAILED: 09/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary for Applications Under Accelerated Examination	Application No.	Applicant(s)	
	10/810,551	FLEMING, EDWARD ANDREW	
	Examiner	Art Unit	
	Bruce F. Bell	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Since this application has been granted special status under the accelerated examination program, NO extensions of time under 37 CFR 1.136(a) will be permitted and a SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE:

ONE MONTH OR THIRTY (30) DAYS, WHICHEVER IS LONGER,
FROM THE MAILING DATE OF THIS COMMUNICATION – if this is a non-final action or a *Quayle* action.
(Examiner: For **FINAL** actions, please use PTOL-326.)

The objective of the accelerated examination program is to complete the examination of an application within twelve months from the filing date of the application. Any reply must be filed electronically via EFS-Web so that the papers will be expeditiously processed and considered. If the reply is not filed electronically via EFS-Web, the final disposition of the application may occur later than twelve months from the filing of the application.

Status

1)☐ Responsive to communication(s) filed on _____.

2)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

3)☒ Claim(s) *1-20* is/are pending in the application.
3a) Of the above claim(s) _____ is/are withdrawn from consideration.

4)☐ Claim(s) _____ is/are allowed.

5)☒ Claim(s) *1-20* is/are rejected.

6)☐ Claim(s) _____ is/are objected to.

7)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

8)☐ The specification is objected to by the Examiner.

9)☒ The drawing(s) filed on *29 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

10)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

11)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a)☐ All b)☐ Some * c)☐ None of:
1.☐ Certified copies of the priority documents have been received.
2.☐ Certified copies of the priority documents have been received in Application No. _____.
3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Oath/Declaration

1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

> The oath or declaration is defective because:
> It does not identify the city and either state or foreign country of residence of each inventor. The residence information may be provided on either an application data sheet or supplemental oath or declaration.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 16 are vague and indefinite with respect to the brine conduit and separator for the spent brine. Neither the instant specification nor the drawings show this aspect of the instant invention. It appears that the unreacted brine in the electrolyzers goes to the hypochlorite and hydrogen separation vessel but there is not conduit that the examiner can see to remove the brine by a separator in that vessel. Is applicant maybe talking about a separator coming out of the electrolyzers for this aspect of the instant invention?

Claim 4 is vague and indefinite with respect to what the element for controlling hypochlorite dosing is since there is no mention of this in the instant specification, nor is

there any disclosure as to how this relates to the apparatus for producing a hypochlorite and hydrogen.

Claims 9-12 are vague and indefinite with respect to the phrase electrolytic production unit. It is unclear to the examiner what this production unit is since the only disclosure in the instant specification is to an electrolyzer, not an electrolytic production unit which could read on an electroplating cell, which is not the same apparatus.

Claims 10-11 and 13 are vague and indefinite with the phrase non-combustible gas. It is unclear what this non-combustible gas is from the instant specification as set forth. There does not appear to be any disclosure as to what the gas is that applicants instantly are claiming as the non-combustible gas.

Claims 2-15 and 17-20 are dependent on claims 1 and 16 and therefore have the same deficiencies.

Correction and/or clarification are requested along with a drawing showing the brine conduit.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Levy et al (4797186) in combination with Pellegri (4240884) and Bryan et al (6468412).

Levy et al disclose a method and apparatus for operating a fuel cell which produces electrical energy in combination with an electrolytic cell which used electrical energy to produce a chemical product. The electrolysis cell produces an oxidant for use in the fuel cell and is linked with the fuel cell by a direct current converter which allows the fuel cell to operate between an upper and lower voltage limit and the electrolytic cell to operate at a voltage which is independent of the fuel cell voltage. See abstract. The electrolysis cell has an anode side and a cathode side. A brine mixer is connected to the anode side via conduit. The brine mixer receives sodium chloride via conduit and hot water via conduit to form brine. See col. 4, lines 48-52. A hydrogen washer receives hydrogen gas from the cathode side of the electrolysis cell via conduit. The hydrogen discharges water via conduit and supplies the fuel cell with a hydrogen rich fuel stream via conduit. The conduit is connected to the hydrogen manifold of the fuel cell. The electrolysis cell is shown to produce hydrogen and a hypochlorite. See col. 5, lines 24-34. During operation of the apparatus, brine is fed from the brine mixer via conduit to the anode side of the electrolysis cell. The chlorine, present as chloride ion in solution forms chlorine. The alkali metal ion and its water of hydration pass through a permionic membrane to the cathode side of the electrolytic cell. The water may be fed both externally into the cathode side or fed as water of hydration passing to the cathode side. See col. 8, lines 49-61. Solution from the cathode is treated by evaporation and the hydrogen gas evolved at the cathode is sent to a hydrogen washer to remove contaminants from the hydrogen gas. See col. 9, lines 3-9.

Levy et al does not disclose separating brine, generated hydrogen and hypochlorite from the electrolyzer.

Pellegri disclose an apparatus for producing alkali metal hypochlorite by passing an alkali metal brine solution through the anode compartment of an electrolytic cell in which the anode compartment and the cathode compartment are separated by a fluid impervious, anion permeable membrane, providing an aqueous support catholyte into the cathode compartment, impressing an electric potential across the anode and cathode to evolve halogen at the anode and hydrogen at the cathode and recovering alkali metal hypochlorite form the anode compartment. See abstract. The electrolytic process for producing sodium hypochlorite is effected with an anode, a cathode and a fluid impervious, anion permeable membrane. An anode may consist of any normally used anodic material such as a valve metal like titanium coated with an electrocatalytic coating of oxides of noble metals and valve metals. A cathode may consist of a screen of steel, nickel or other conducting material with a low hydrogen overvoltage. Anode and cathode are connected to the positive and negative poles of a direct current source. See col. 5, lines 27-41. By applying a sufficiently high electric voltage between the anode and cathode, an electrolysis current flows through the cell to evolve chlorine at the anode surface and hydrogen at the cathode surface. The hydroxide ions migrate through the membrane from the catholyte to the anolyte to react therein with chlorine to produce sodium hypochlorite in the anolyte which is recovered as a dilute solution effluent from the anodic compartment. Hypochlorite ions tend to diffuse through the membrane towards the catholyte under the net driving force resulting from the opposing

effects of the difference in concentration existing between the anolyte and the catholyte and the electrical field existing across the anionic membrane. See col, 5, line 61 – col. 6, line 9. The anodic solution may be recycled one or more times through the anode compartment and through an external tank in parallel connection with the anolyte compartment depending on the hypochlorite concentration desired in the effluent solution. See col. 6, lines 41-45. During operation of the cell, the cathode compartment and tank are kept filled to a level of tank with solution of alkali metal chloride or other support electrolyte such as an alkali metal hydroxide or carbonate. The hydrogen evolved at the cathode bubbles through the catholyte and leaves the cell through the bent. A plurality of cells may be connected in series to provide a greater concentration of hypochlorite in the anolyte effluent. See col. 7, lines 28- 48.

Bryan discloses an apparatus and method for venting hydrogen from an electrolytic cell. A brine solution is supplied to an electrolytic cell where hypochlorite and hydrogen gas are produced. See abstract. The electrolytic cell system includes a salt solution that may be either a natural source of brine or a synthetic source such as that made in a salt saturator which is a purer source of brine than the natural source. See col. 4, lines 58-67. The saturated brine solution contains about 30% chloride and is diluted by 90% softened water to obtain a brine solution containing approximately 3% sodium chloride.

Woolacot discloses that water softening in a demineralized unit or deionizer is known for use to remove harmful effluents in process water. See col. 2, lines 51-55 and 61-68 and col. 3, lines 16-24.

The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the instant invention was made because even though the prior art of Levy et al does not show the electrolyzer as producing brine, hypochlorite and hydrogen it appears that it does since the prior art of Pellegri shows a similar cell that does produce all three components and whether Levy et al does produce all three or not, Pellegri shows that one having ordinary skill in the art would have the knowledge and the apparatus that could be used in Levy et al to produce such a system in conjunction with a fuel cell that is provided with hydrogen for the purpose of providing power to the electrolytic cell. Fuel cells are well known in the art for being utilized in a regeneration cell configuration for the purpose of supplying power to an electrolytic cell to maintain the operation of such cell through the production of hydrogen from the electrolysis cells, since electrolytic cells and fuel cells operate in reverse, it would be within the ability of the person having ordinary skill in the art to use the two components to supply power and chemical constituents to each other to continue the operation of each component in a regenerative capacity. The prior arts of Bryan and Woolacot are disclosed for their teachings to show that it is known in the art of electrolysis to use a brine saturator for the purpose of giving a more pure brine solution and to use a deionizer or demineralizer to produce more pure water prior to submitting to the brine saturator so that a more pure product can be utilized in the electrolysis system to yield a more concentrated form of the hypochlorite material. The recitation in the instant claims with respect to the anode plates and cathode plates being separated from one another in each stack by non-conductive partitions is conventional in the art and known to the

person having ordinary skill in the art via series connection so that the cells don't short out. The compression of hydrogen in storage tanks is also conventional in the art. Therefore, the prior arts of Levy et al in combination with Pellegri, Bryan and Woolacot render the applicants instant invention as obvious for the reasons set forth above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bruce F. Bell whose telephone number is 571-272-1296. The examiner can normally be reached on Monday-Friday 6:30 AM - 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BFB
September 5, 2006

Bruce F. Bell
Primary Examiner
Art Unit 1746